This invention relates to firearms and more particularly to new and improved means for detachably mounting a barrel upon the frame of a firearm.

It is an object of the present invention to provide novel and improved means for detachably mounting a barrel upon the frame of a firearm, which mounting means is simple and highly effective in ensuring proper alignment of the barrel upon the frame even after extensive usage so as to obviate the requirement for hand-fitting of the barrel to the frame.

It is also an object to provide an improved barrel mounting means that facilitates installation and removal of the barrel even by one who is unskilled so as to enable interchanging of barrels by the owner of the firearm without special tools.

Another object is to provide such a detachable barrel mounting for a pistol wherein a simple and relatively economical arrangement of parts which is readily assembled provides a rigid support for the barrel upon the frame and maintains proper alignment upon the frame during long and continuous operation of the pistol without the necessity for adjustment after initial installation.

A further object is to provide a detachable barrel mounting for firearms which is rugged, relatively economical and self-compensating for wear and which enables the replacement of the conventionally employed steel frames by frames constructed of a metal of lesser strength than steel such as aluminum without affecting the firm retention of the barrel or its continuing alignment after extensive usage.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application which will be indicated in the appended claims.

In the drawings:

FIG. 1 is a partially exploded side view of a pistol incorporating the barrel mounting of this invention, with parts shown partly broken away and partly in section;

FIG. 2 is a fragmentary longitudinal cross-sectional view of the barrel mounting portion of the frame with the barrel shown in phantom as mounted thereon;

FIG. 3 is an enlarged transverse cross-sectional view of the pistol taken substantially along the line 3--3 of FIG. 2; and

FIG. 4 is a fragmentary front end view of the pistol barrel and frame showing the barrel positioned above the frame for installation thereon.

Referring to the attached drawing, the invention has been shown as embodied in a pistol having a barrel 10 with a bore 11 and a frame 12 upon which the barrel is mounted as shown in FIGS. 2 and 3. In the conventional manner, the pistol frame 12 has a grip portion 14, a trigger guard 16 and a trigger 17 pivotally mounted on the frame for movement therein. The slide 18 is supported upon the frame 12 in alignment with the barrel 10 for sliding movement rearwardly thereof in recoil against the usual slide return spring (not shown) for ejecting a spent round from the firing chamber 20 and for movement forwardly by the recoil spring against the breech face 22 of the barrel. Also shown illustrated in FIG. 1 are safety 21 engageable in the slot 23 of the slide and a slide stop open latch 25.

To provide firm support for the barrel 10 on the frame 12 and to maintain the barrel and its bore 11 in strict longitudinal alignment on the firearm, the frame is machined upon its upper edge a pair of elongated ways 24 extending longitudinally of the frame which are laterally spaced to opposite sides of and extend parallel to the horizontal center line of the frame 12 and barrel bore 11. The ways 24 are received in cooperating machined grooves 27 extending along the bottom edge of the barrel 10.

In the illustrated embodiment, the configuration of the ways 24 provides a pair of spaced vertically extending parallel faces 26 and a pair of supporting faces 28 inclined downwardly, preferably at an angle of 45°, from adjacent the faces 26 toward the transverse center line of the pistol frame. The barrel grooves 27 receiving the ways 24 are cooperatively dimensioned and configured to form parallel plane faces 30 which extend parallel to the vertical faces 26 and inclined supporting faces 32 that rest upon the inclined supporting grooves of the ways. This construction provides an interfitting relationship of the barrel and frame with a relatively large area of interfacial contact between the inclined faces 28 and 32 of the frame and barrel, respectively. Through this interfitting support of the barrel by the frame upon the inclined faces, the barrel 10 is initially aligned upon the frame and is restrained against pivotal and lateral movement on the frame 12, and any movement of the barrel longitudinally of the frame will not affect the alignment of the barrel 10 with the slide 18 and the frame 12.

In the forward portion of the frame 12 between the ways 24 is an elongated well or slot 34 defined by a pair of parallel upright side walls 36. A pair of opposed slots 38 extend forwardly and downwardly from the inclined supporting faces 28 along the sides of the well 34 at an acute angle to the longitudinal axis of the pistol. The opposed slots 38 are defined in part by shoulder faces 40 which lie in a common plane extending at an angle to the longitudinal axis, preferably at an angle of about 30°.

The barrel 10 has an integrally formed downwardly extending lug or projection 42 having parallel side walls 44 and a transverse cylindrical opening 46 which snugly receives a generally cylindrical retaining pin 48 having end portions 50 extending beyond the side walls 44 of the lug and into the opposed slots 38. The pin end portions 50 are partially cut away to form flattened shoulders 52 that are in engagement with the inclined shoulder faces 40 for guiding or wedging the retaining pin within the slots 38. The retaining pin 48 is preferably locked in the lug opening 46 to prevent inadvertent disassembly, conveniently by staking the lug side walls 44, preferably so that the pin is free to rotate within the opening to ensure alignment of the shoulders 52 in face-to-face engagement with the slot faces 40.

The barrel 10 is readily assembled upon the frame 12 by retracting the slide 18 into the latched open position and by moving the barrel 10 downwardly from a position above the ways 24, as seen in FIG. 4, until the retaining pin 48 with its shoulders 52 facing forwardly and upwardly is received within the inclined slots 38. The barrel 10 is then guided forwardly and downwardly until it rests solidly on the ways 24.

When seated, the barrel 10 is positively retained against rearward movement relative to the frame 12 by a roundheaded screw 56 extending rearwardly and upwardly from the forward edge of the frame 12 below the barrel 10 into threaded engagement with the lug 42. Preferably, the axis of the screw extends at an angle of approximately 15° to the longitudinal axis of the barrel so as to substantially blace the included angle formed by the plane
of the slots 38 and the longitudinal axis of the barrel. A nylon lock washer 58 is used to overcome any tendency of the screw 56 to become loosened after repeated firings of the pistol.

Upon forward longitudinal movement of the barrel 10 relative to the frame 12, the barrel 10 is cammed downwardly towards the frame by reason of the positive retention provided by the engagement of the screw 56 with the lug 42 and the camming action of the retaining pin 48 and the downwardly and forwardly inclined shoulder faces 49 of the slots 38. More particularly, upon such forward movement, the lug 42, through the retaining pin 48, is further cammed downwardly or inwardly of the well 54 by the inclined shoulder faces 49, thus drawing the barrel more tightly against the frame 12 to assure firm engagement.

Accordingly, a large part of the force on the barrel 10 due to the return engagement therewith by the slide 18 is resisted by frictional contact across the relatively large surface area of the inclined surfaces 32 and 28 provided by the barrel grooves 27 and ways 24, respectively, and only a small part of this forward force is effectively transmitted through the pin 48 and the shoulder faces 40 to the frame. As a result, only insignificant wear and distortion has been noted in the pin 48 and shoulder faces 40 even after long and continuous operation of the pistol and even when the frame is constructed of a metal having lesser strength than steel, such as aluminum. Moreover, any forward movement of the barrel 10 on the ways 24 occurred by a slight wearing of the pin 48 and shoulders 40 will not affect the correct alignment of the barrel with the slide 18 and frame.

It is, therefore, seen that the barrel mounting of this invention provides a firm support for the barrel, maintains the barrel in proper alignment throughout long and continuous use of the firearm, and enables the barrel to be readily disassembled and assembled from the frame by an inexperienced person. Additionally, the barrel mounting is one which can be economically constructed according to commercial tolerances and which nevertheless will enable barrels to be interchanged and replaced without hand fitting to provide excellent fit and alignment.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above described will become readily apparent without departure from the spirit and scope of the invention, the scope of which is defined in the appended claims.

1. A firearm having a frame, a barrel mounted on the frame, said frame and barrel having longitudinally extending interfitting portions in cooperative engagement for supporting the barrel in longitudinal alignment on the frame, positive retention means connecting the barrel and frame and maintaining the interfitting portions in cooperative engagement, said positive retention means including means camming the barrel toward the frame upon movement of the barrel forwardly of the frame, and means for drawing the barrel forwardly relative to the frame during the mounting of the barrel on the frame.

2. The firearm defined in claim 1 wherein the interfitting portions are formed by a pair of cooperating ways and grooves on the frame and barrel.

3. A firearm having a frame, a barrel having a bore and mounted on said frame, said frame and barrel having interfitting portions extending parallel to said bore and in cooperative engagement for supporting the barrel in longitudinal alignment on the frame, positive retention means connecting the barrel and frame and maintaining the interfitting portions in cooperative engagement, said positive retention means including camming means interconnecting the barrel and frame to draw the barrel towards the frame upon longitudinal movement of the barrel forwardly of the frame, and means for drawing the barrel forwardly relative to the frame during the mounting of the barrel on the frame.

4. A firearm having a frame member, a barrel member mounted on the frame member, said frame and barrel members having longitudinally extending interfitting portions in cooperative engagement for supporting the barrel member against movement transversely of the frame member, and positive retention means connecting the barrel and frame members and maintaining the interfitting portions in cooperative engagement, said positive retention means including a vertically and forwardly inclined cam surface on one member and a follower on the other member for wedging the interfitting portions of the barrel and the frame member together upon movement of the barrel member forwardly of the frame member whereby a force directed longitudinally forwardly on the barrel member is transmitted to the frame member through the positive retention means and through the interfitting portions of the barrel and frame members with increased frictional engagement therebetween.

5. A firearm having a frame member, a barrel member mounted on said frame member, said frame and barrel members having longitudinally extending interfitting portions in cooperative engagement for supporting the barrel member in longitudinal alignment with the frame member, and positive retention means connecting the barrel and frame and maintaining the interfitting portions in cooperative engagement, said positive retention means including an elongated well in the frame member between said interfitting portions and having side portions providing shoulders inclined downwardly and forwardly of the frame member and a lateral projection on said barrel member cooperatively engaged with said inclined shoulders to draw the barrel projection downwardly into the well in the frame member upon movement of the barrel member forwardly relative to the frame member during mounting to wedge the interfitting portions of the barrel and frame members.

6. A firearm having a frame, a barrel mounted on the frame and having a bore extending therethrough, said frame and barrel having a pair of parallel spaced longitudinally extending interfitting ways and grooves in cooperative engagement for supporting the barrel on the frame against movement transversely thereof, said frame having an elongated slot therein between said pair of ways and grooves and a pair of opposed slots on opposite sides of said elongated slot inclined downwardly and forwardly of the frame and opening into said elongated slot a downwardly extending lug on said barrel received in said elongated slot and having a transverse opening therein, and a retaining pin received within said lug opening and projecting from said lug transversely of the frame into said opposed slots to wedge the elongated slot upon longitudinal movement of the barrel forwardly of the frame whereby a moment of force exerted longitudinally forwardly on the barrel results in increased frictional engagement between the interfitting ways and grooves.

7. The firearm defined in claim 6 wherein said interfitting ways and grooves have vertical faces and opposed supporting faces inclined towards the center line of said frame.

8. A firearm comprising a frame, a barrel mounted on the frame and having a bore extending therethrough, said frame and barrel having thereon a pair of longitudinally extending interfitting ways and grooves spaced to opposite sides of the center line of said barrel bore, said frame having an elongated slot opening on the upper edge thereof and centered with said pair of ways and grooves and a pair of opposed slots on opposite sides of said elongated slot, said pair of slots being inclined downwardly and forwardly of the frame and opening into said elongated slot, a downwardly extending lug on said barrel received in said elongated slot, a pair of guides on said lug extending transversely of the frame and received within said pair of opposed slots, and means releasably retaining the barrel against movement longitudinally of the frame,
said lug being cammed downwardly into said elongated slot upon movement of the barrel forwardly of the frame by engagement of the guides in said pair of opposed slots whereby a moment of force exerted longitudinally forwardly on the barrel cams the lug inwardly of the frame and thereby wedges the frame and barrel together for frictionally retarding the force on the barrel.

9. The firearm defined in claim 8 wherein the pair of opposed slots are inclined at an angle of substantially 30°, and wherein the means releasably retaining the barrel includes a screw extending from the forward end of the frame rearwardly into threaded engagement with the barrel.

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